



Saving a Life in 20 Minutes Through Teamwork and Training

For those who work in the operating theatre, effective teamwork and comprehensive training may literally mean the difference between life and death. This was brought into attention when a patient showed signs of a rare condition while on the operating table, and was saved by a team that put these qualities into practice. (From left: Dr Shahani Jagdish Menghraj, Senior Consultant, Department of Paediatric Anaesthesia, KKH; Ms Wang Zhaoli, Nurse Clinician, OT services, KKH and Ms Shen Haiying, Senior Nurse Manager, OT services, KKH)

When a three-year-old girl entered an operating theatre in KK Women's and Children's Hospital (KKH) for a routine dental procedure, the last thing that would have occurred to anyone was the possibility that her life hung in the balance.

But that was precisely what was at stake – and the girl is alive today, thanks to the teamwork and preparedness of a team of medical professionals who saved her life in just 20 minutes.

The successful aversion of disaster is a testament to the professionalism and positive work practices of the Day Surgery team at KKH, which ensured they were ready to take quick and decisive action despite facing a very uncommon challenge.

Sudden Crisis

Nothing unusual was detected when the patient went under general anaesthesia, but 25 minutes into the procedure, her body temperature started rising very fast and all routine possible causes were ruled out.

Drawing from his experience in managing a similar incident, Dr Shahani Jagdish Menghraj, Senior Consultant, Department of Paediatric Anaesthesia, who was the anaesthetist on duty, diagnosed the problem as Malignant Hyperpyrexia (MH).

Rare Condition

MH occurs when a patient has an abnormal reaction to one of two agents used in the administration of general anaesthesia: suxamethonium chloride and sevoflurane. The main indication of MH is that the body temperature will rise rapidly, sometimes up to 1 degree Celsius in minutes.

Once the patient's temperature hits 42 degrees, vital organs like the brain and heart will be affected, and this may result in permanent organ damage and even death.

A genetic condition, MH is almost undetectable until it manifests during the administering of general anaesthesia. The only way to avoid it is to check the patient's family history, but the family may not be aware of it either.

It is so rare that KKH has only seen two MH cases since it opened at its current location in 1997 – coincidentally, Dr Shahani was the anaesthetist in charge for both these cases.

Hence, Dr Shahani, who has been with the hospital since 2007, knew he had to act fast. He immediately activated a Code Blue – an emergency situation in which a patient requires cardio-pulmonary resuscitation and a team of medical personnel is called to immediately rush in to help save the patient.

Role Clarity

Upon activation, Nurse Clinician Wang Zhaoli, who was the nursing team leader, sprang into action by making sure the nurses were carrying out their assigned roles.

A MH kit was brought in immediately, and an internal Code Blue was activated, so those in the operating theatre who were available could help out in the multiple tasks that had to be performed simultaneously. Staff loudly vocalised what tasks they were going to do to prevent duplication of work and wastage of manpower.

Ms Wang, who has been with KKH since 2002, also helped with the arterial line insertion, while other nurses were performing other tasks like cooling down the patient with ice water. Crucially, three nurses were assigned to dilute the powder-based chemical Dantrolene, the only treatment for MH.

Thanks to the clarity of roles that contributed to the quick and efficient intervention by the team, the patient's temperature was brought down to normal within 20 minutes.

Excellent Teamwork

Paying tribute to how his team worked together, Dr Shahani said: "I enjoy working with the whole team... without teamwork we cannot do anything."

Referring to the multiple roles, he added: "People must be knowledgeable about what they're doing, what is expected of them and be ready to do perform their tasks... For this particular case, the team knew very well what to do."

Humbly downplaying the contribution of his quick diagnosis, he attributed the successful patient outcome to the "experience of the whole team" and not the doctor in particular.

“Even if the doctor diagnoses it, he only has two hands and one brain. And you need 12 hands and six brains for a successful outcome. The doctor can only diagnose and give directions. And if directions are not acted upon, he or she cannot do it alone.”

In fact, he added: “We did a headcount. There were 22 people who helped in various ways towards the successful outcome in this case.”

Prepared for Anything

Dr Shahani also emphasised the importance of simulation training, where the skills of the healthcare team are tested in a crisis incident enacted with a dummy.

All members of the team are prepared, especially the newer ones, and the training is carried out a few times a year. “Although the incident is so rare, if we are not clear about what we have to do, then the outcome would be very dire,” said the doctor.

The training also includes a debriefing where staff can point out gaps in the situation handling and suggest improvements, said Senior Nurse Manager Shen Haiying. The new measures implemented to close these gaps are then shared across all the operating services that use general anaesthesia.

“That means if I did the simulation in the Day Surgery setting, we would share the debriefing outcome with the teams at the Major Operating Theatres. This way, everyone is kept on the same page,” she added.

In fact, the most junior staff are encouraged to make the first suggestions, as they are undergoing simulation training for the first time, so they would have fresh ideas.

Dr Shahani shared: “It’s an open system, we encourage people to speak up, come up with ideas and suggestions, no matter how big or small.”

Agreeing, Ms Wang added: “We trust each other and respect each other, so we’re empowered to speak up.

The Little Things

An example of a gap identified during simulation training that led to an improvement measure is the use of gamgee tissue to hold the ice needed to cool down the patient during an MH incident. As gamgee tissue absorbs ice water better than a normal towel, it is more effective in bringing down the patient’s temperature.

Another example is the ice itself; during an MH simulation it was discovered that as Day Surgery did not have ice, somebody had to run up two floors to get it. Thus Ms Wang decided to keep two bags of ice cubes in the Day Surgery staff pantry fridge, labelled “for MH use only” so they are not used for other purposes.

“And then we disseminated this to everybody in Day Surgery... So the person who is asked to get ice knows exactly where to get it,” said Dr Shahani.

Significantly, the MH case occurred just weeks after these measures were implemented, meaning they contributed towards saving the life of the patient – showing that no improvement is too small to make a difference.

“These may be small points, but we keep improving,” added the doctor.

As Ms Shen described the team’s constant quest for improvement: “Every training session will identify areas for improvement, however small. From previous simulations, we may think we have all bases covered, but after we do the simulation we will find more gaps, and from there we can always improve further.”

Passion is Primary

Despite all three members of the team having been on the job for many years, they still find it fulfilling, and credit their passion for the job as the motivation that keeps them going.

“The satisfaction on the faces of the children and the parents is one compelling reason for doing the best we can,” summed up Dr Shahani, who added: “If you don’t have passion, you won’t do justice to your work.”